

I- Measuring plaque & calculus

To measure **oral cleanliness** or (**oral hygiene**) level we have to assess two parameters:

- 1- Soft debris & plaque accumulation.
- 2- Calculus accumulation.

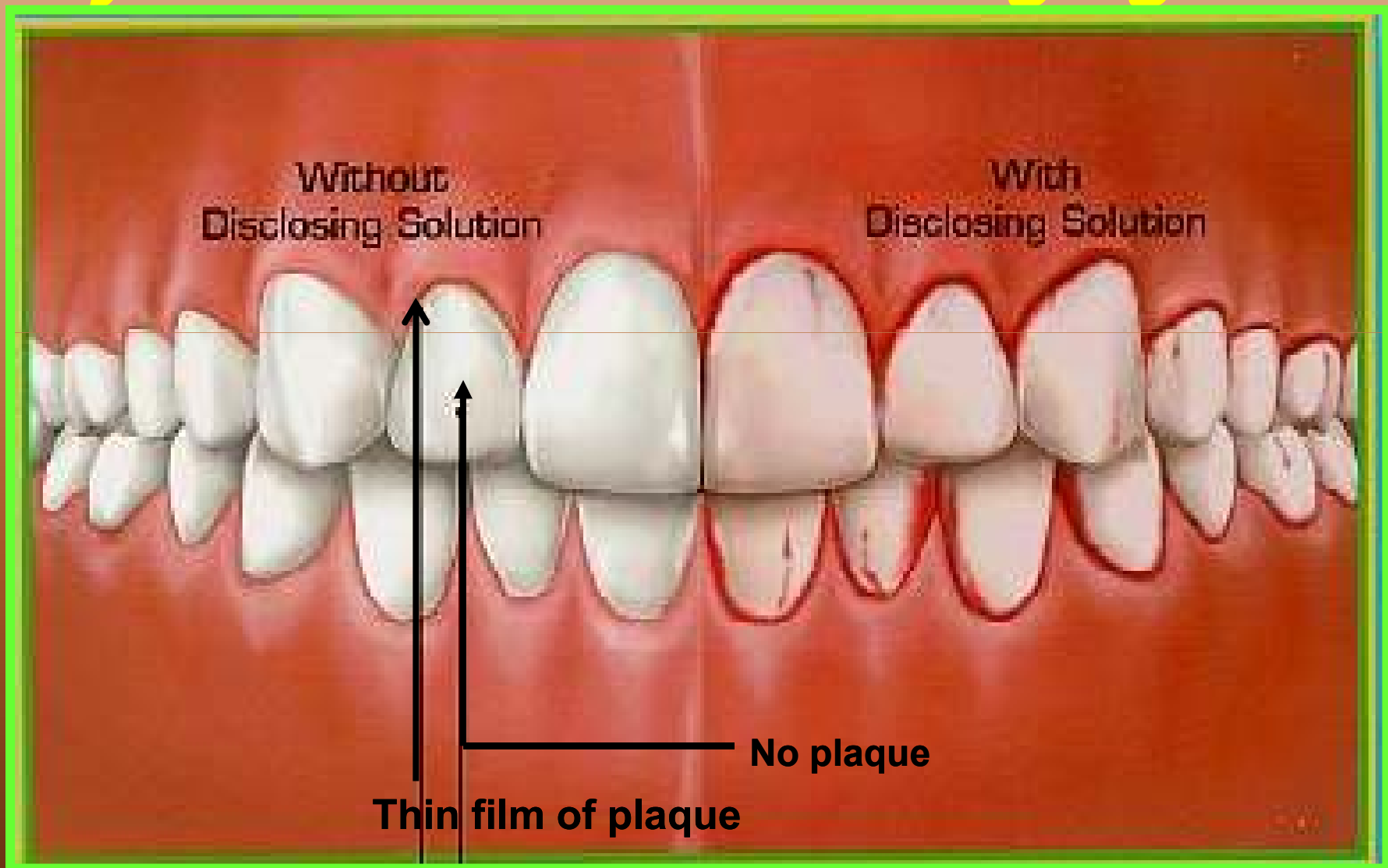
By the use of ***an index*** we can rate an individual or a group into : ***excellent***, ***good, fair*** or ***poor*** oral hygiene.

Amount of plaque & calculus ; two indicators for oral hygiene level.



Both plaque & calculus are associated with periodontal disease ; gingivitis and periodontitis.

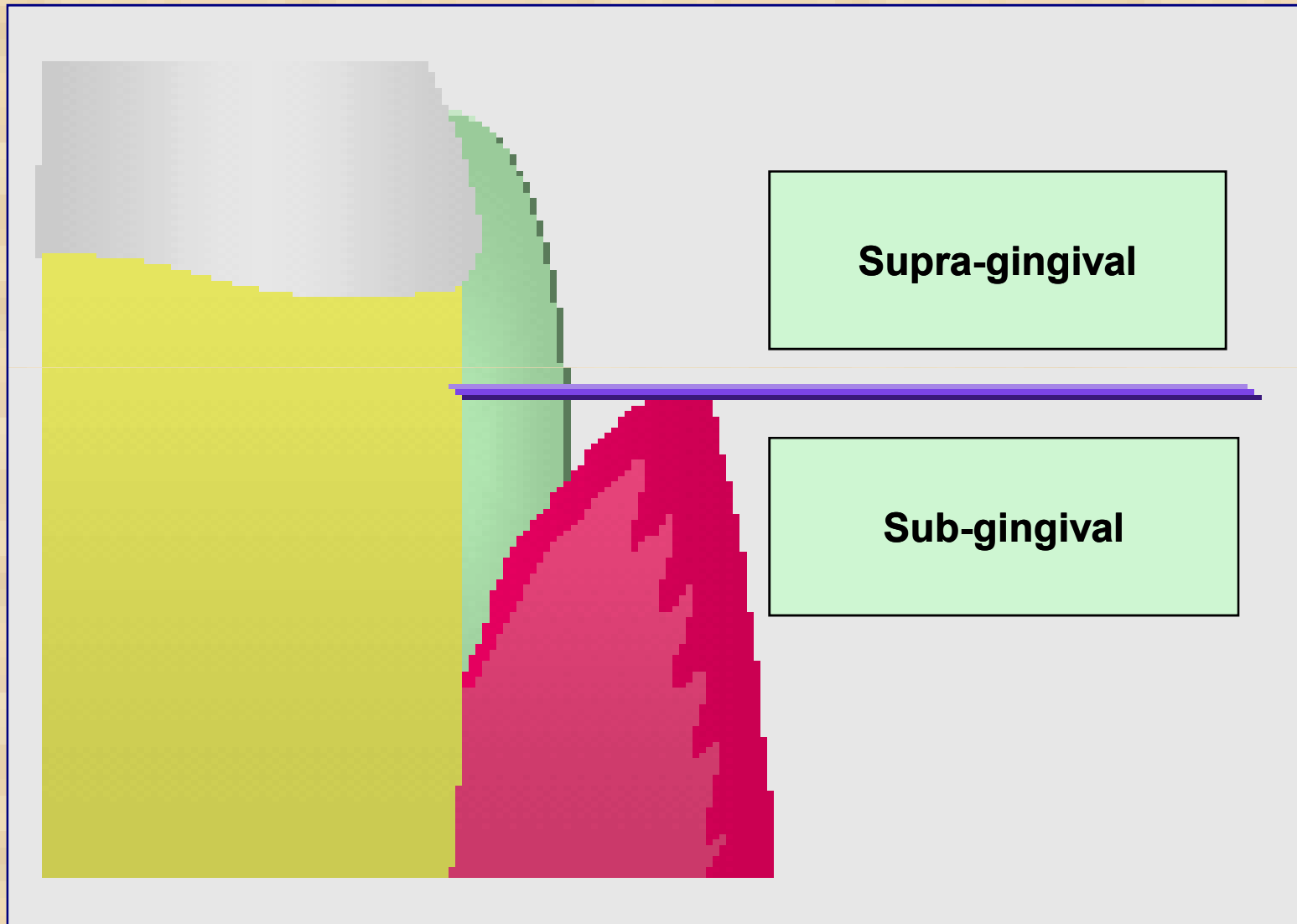
A thin plaque layer can be seen by the use of a disclosing agent.



Dental plaque is evident to the patient by disclosing agents.



Calculus & plaque deposits are either supragingival , subgingival , or both



Indices that measure oral cleanliness:

1-Simplified oral hygiene index.

2-Plaque index.

3- Patient hygiene performance index.

Simplified Oral Hygiene Index

OHI-S

- This index is developed by Green & Vermillion (1960).
- At first it is based on full mouth examination ➤ Oral Hygiene Index (OHI).
- Then it is simplified in (1964) to include only six tooth surfaces ➤ *OHI-S*.

➤ **OHI-S** measures oral cleanliness by estimating tooth surfaces covered by debris & calculus.

➤ It is a reversible index.

➤ It can be used for large-scale epidemiological surveys.

➤ OHI-S is not sensitive enough to measure Oral hygiene status on an individual patients.

OHI-S HAS 2 COMPONENTS

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graph TD; A[OHI-S HAS 2 COMPONENTS] --> B[Simplified debris index<br/>DI-S]; A --> C[Simplified calculus index<br/>CI-S]; B --> D[It measures soft debris:<br/>Food remnants , materia<br/>alba , plaque , as well as<br/>stain.]; D --> E[Score: 0 → 3]; C --> F[It measures supra -<br/>gingival and sub-gingival<br/>calculus.]; F --> G[Score: 0 → 3];
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Simplified debris index
DI-S

It measures soft debris:
Food remnants , materia
alba , plaque , as well as
stain.

Score: 0 → 3

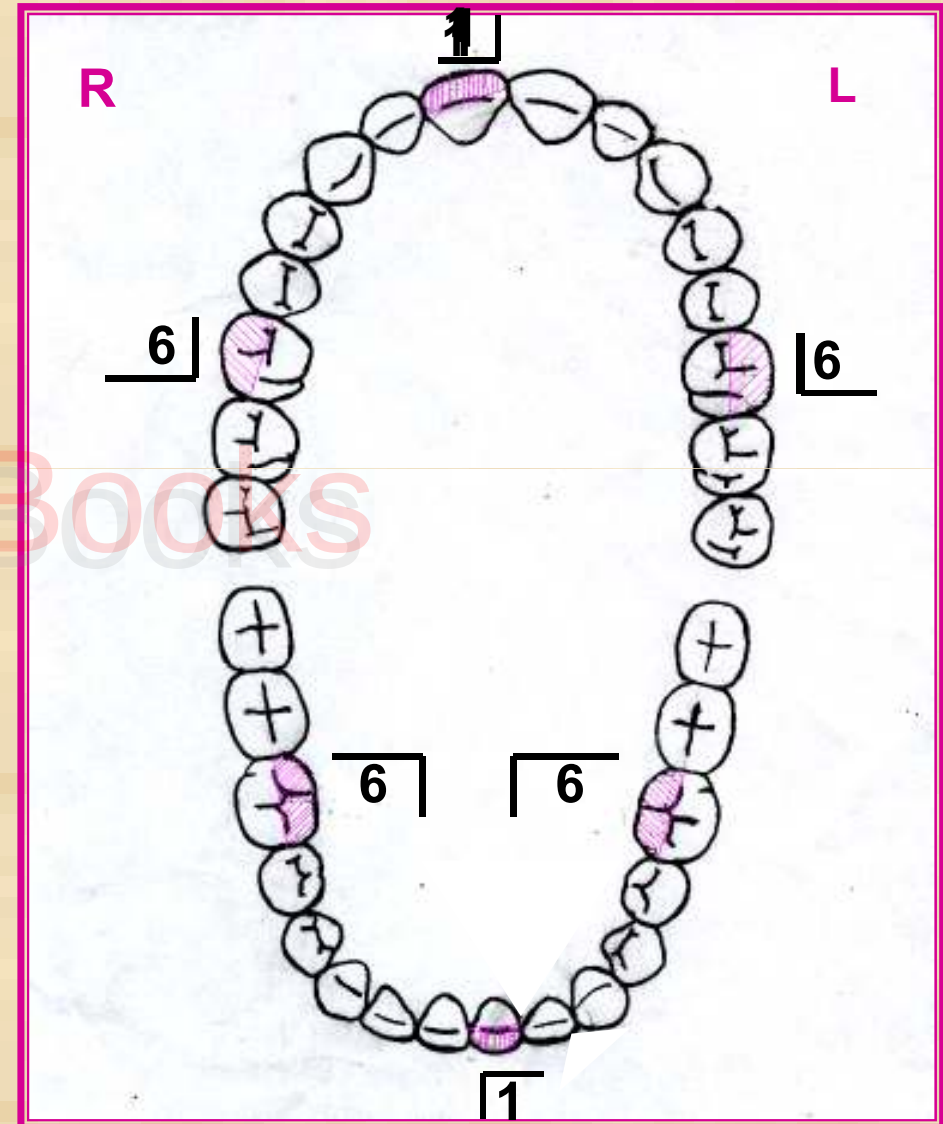
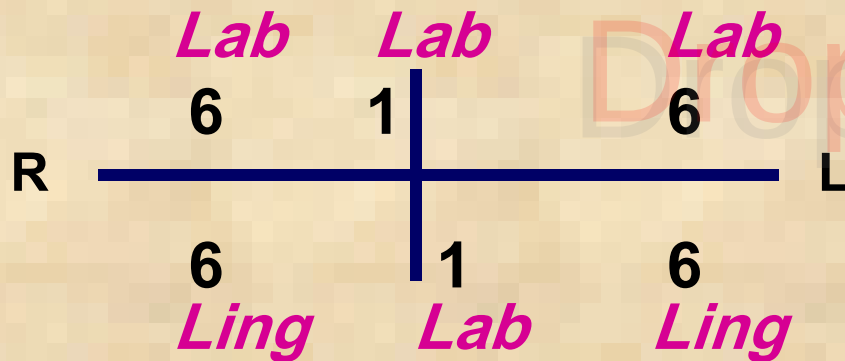
Simplified calculus index
CI-S

It measures supra -
gingival and sub-gingival
calculus.

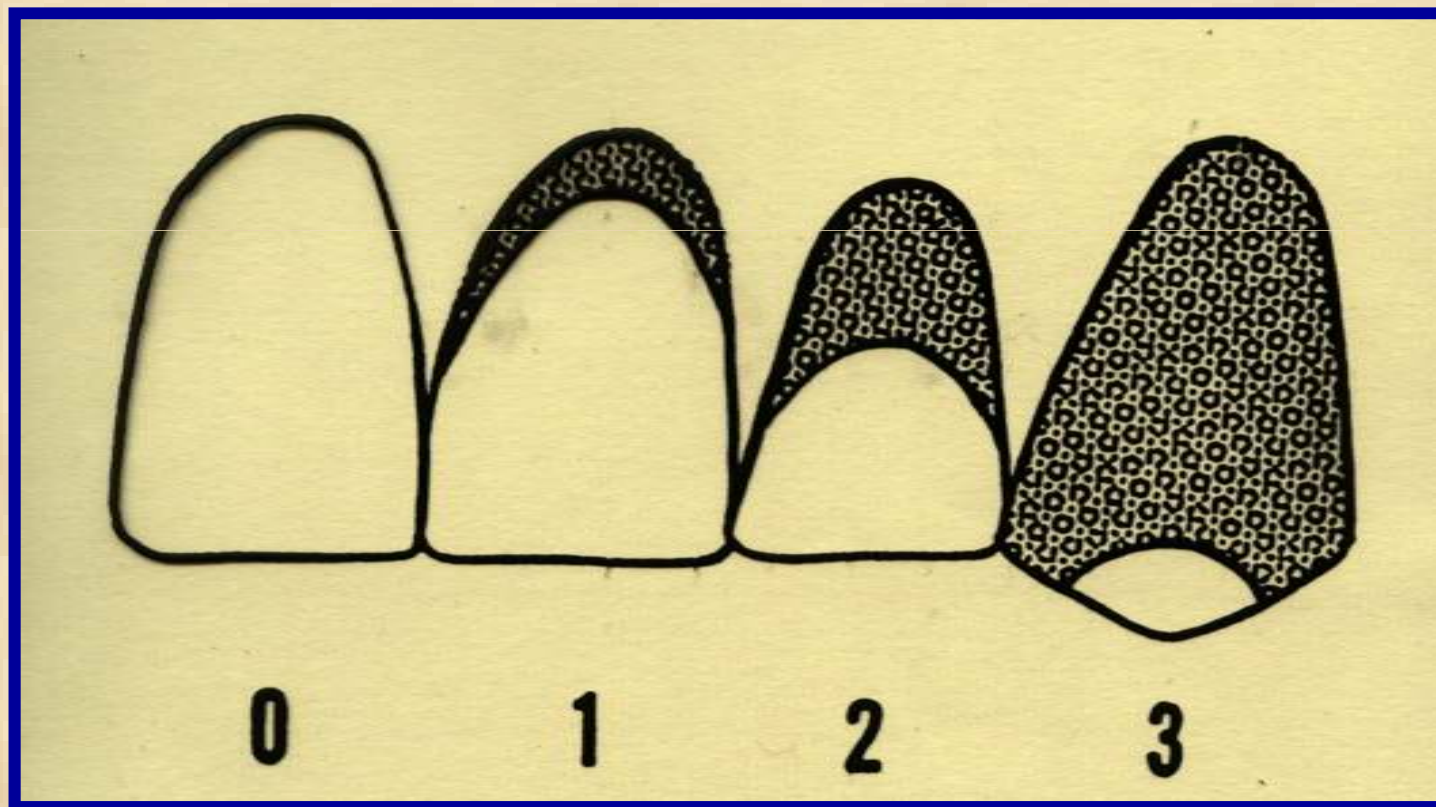
Score: 0 → 3

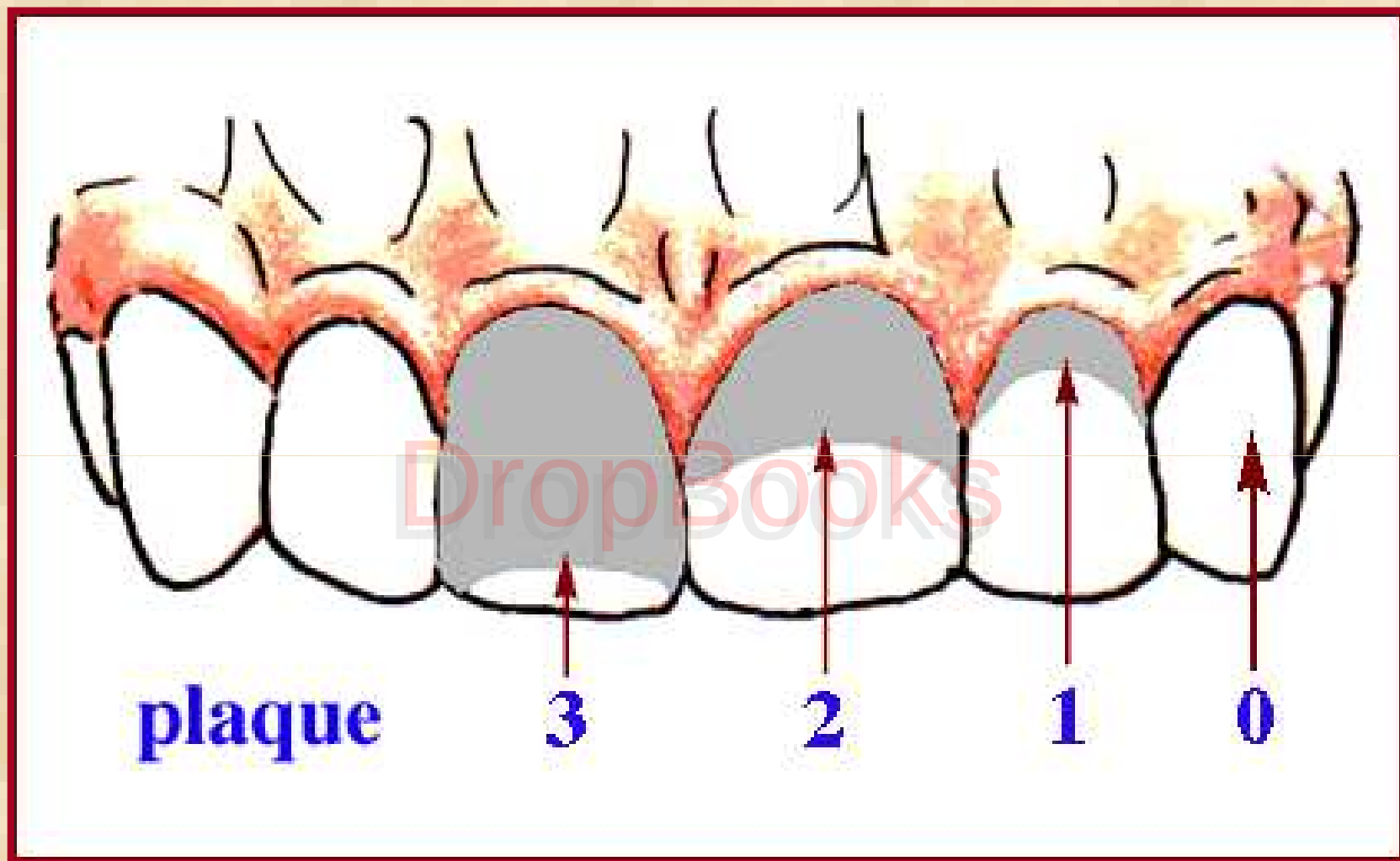
SELECTION OF TEETH

- 6 surfaces have to be examined:

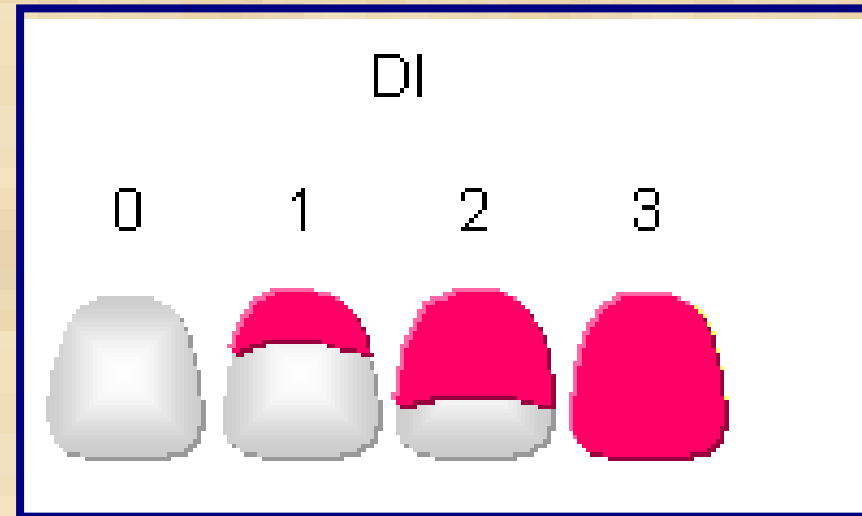


Criteria for scoring oral debris (DI-S) component of OHI-S :





0-No debris or stain.



1-Soft debris covering *not* $> 1/3$ of tooth surface .

OR the presence of extrinsic **stains** regardless of surface area covered.

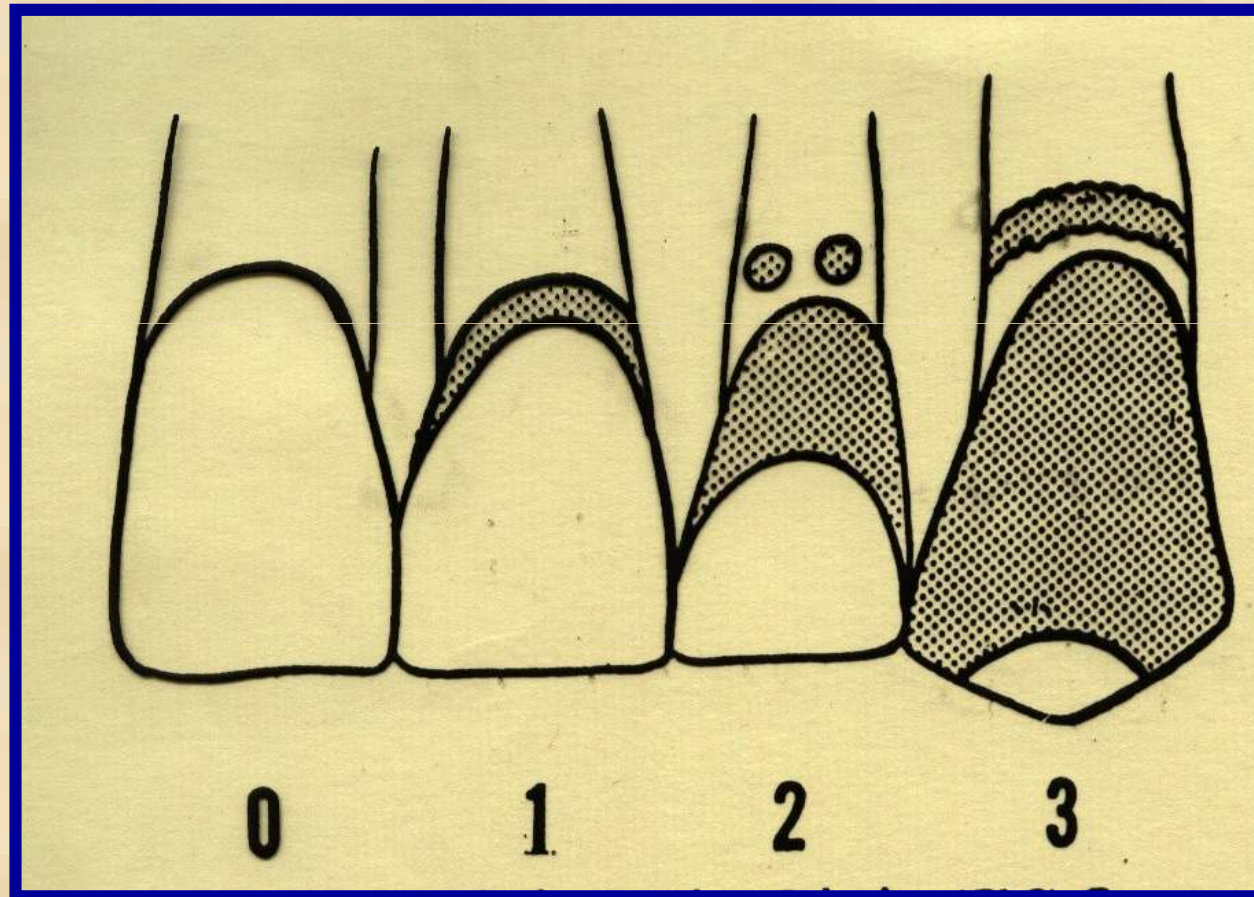
2-Soft debris covering $> 1/3$ but *not* $> 2/3$ of tooth surface.

3-Soft debris covering $> 2/3$ of tooth surface.

**The presence of stain is
scored 1 regardless of area
covered**



Criteria for scoring calculus (C/-S) component of OHI-S



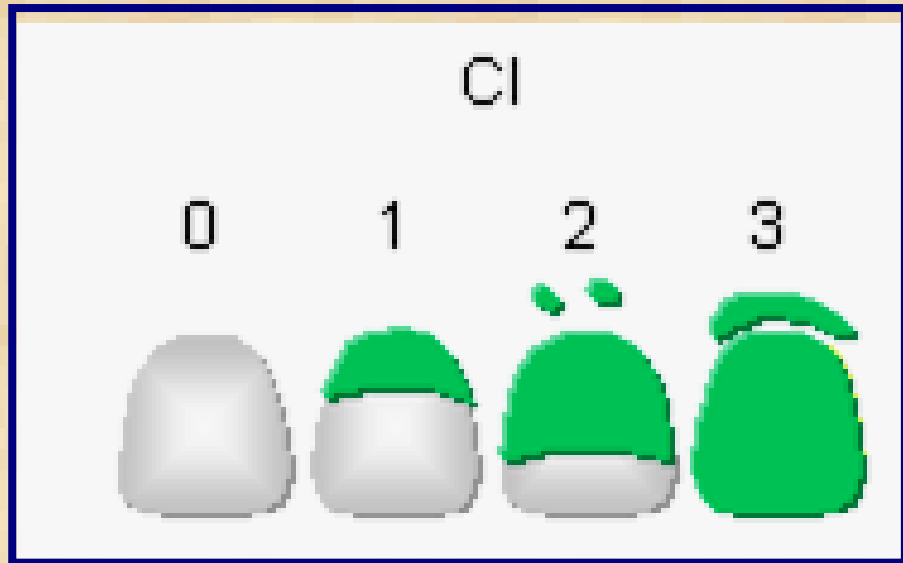
0-No calculus present.

**1-Supragingival
calculus**

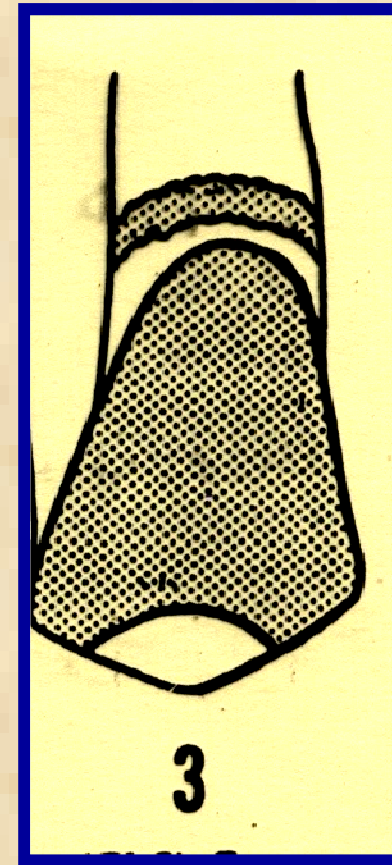
**covering *not* > 1/3 of
tooth surface.**

2-Supragingival calculus

**covering > 1/3 but *not* > 2/3 of tooth *OR*
the presence of small flecks of
subgingival calculus around the
cervical portion of the tooth *OR both* .**



- 3-Supragingival calculus covering $> 2/3$ of tooth surface *OR* a continuous heavy band of subgingival calculus around the cervical portion of the tooth *OR* both.





Heavy band of calculus extending subgingivally.

Scored 3 by CI-S component of OH-S.

Scoring for OHI-S:

DI-S=

$$\frac{\text{Total Debris Scores}}{\text{No. Of Teeth Examined}}$$

CI-S=

$$\frac{\text{Total Calculus Scores}}{\text{No. Of Teeth Examined}}$$

$$\text{DI-S} + \text{CI-S} = \text{OHI-S}$$

0



3

0



3

0



6

PLAQUE INDEX (PI. I)

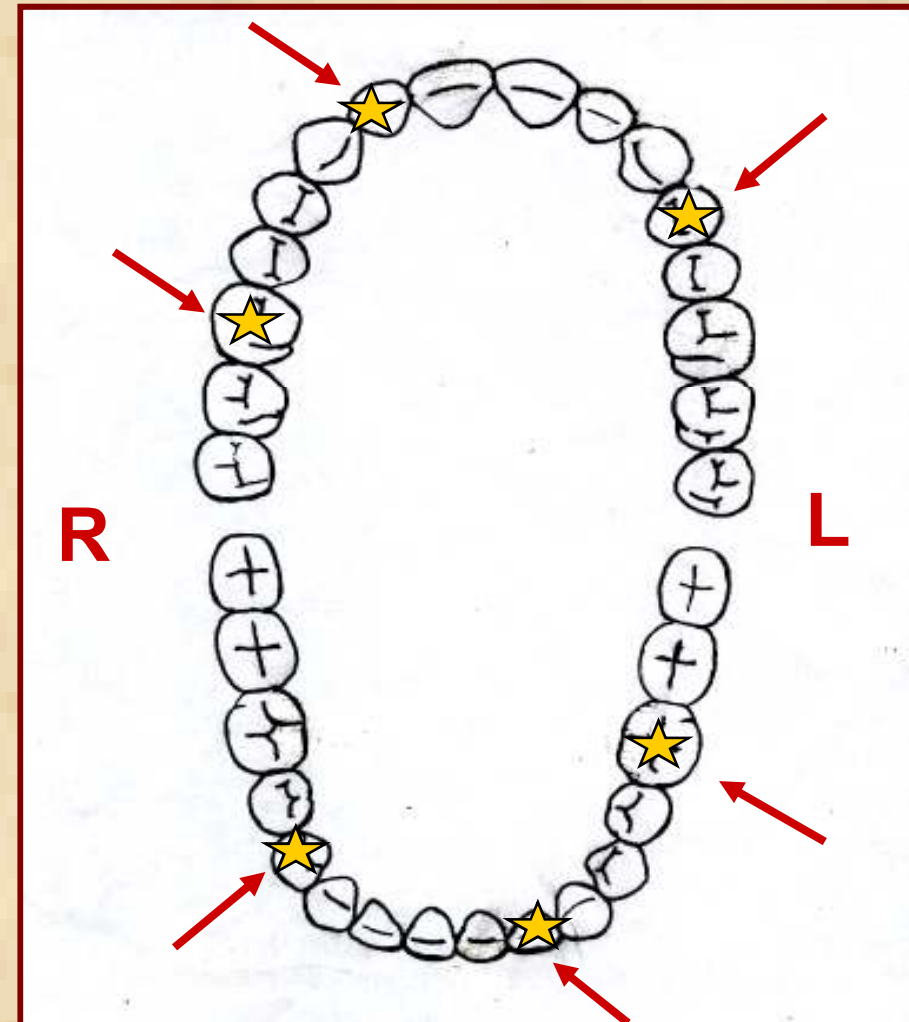
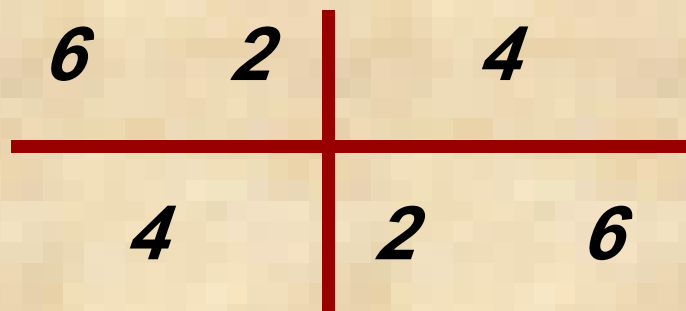
- ◆ It is developed by *Silness & Loe*.
- ◆ Plaque index measures *thickness* of plaque at *gingival area*.
- ◆ It is a *reversible* index.
- ◆ It is used *with GI* to assess level of **oral hygiene** (oral cleanliness) and condition of gingival tissues in *surveys* or *clinical trials*.

Selection of teeth for *PLI* :

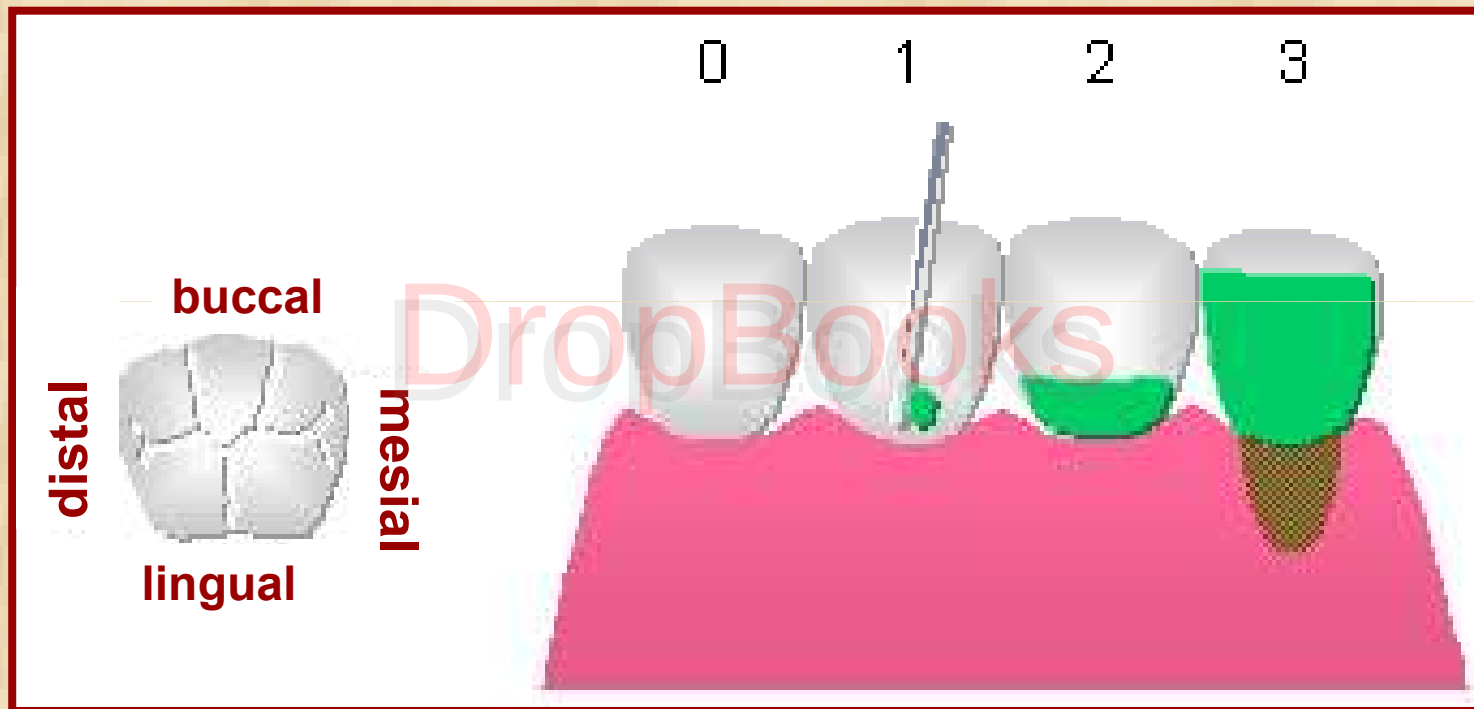
► All teeth examined

OR

► Selected teeth can be examined:



Criteria of plaque index :



Criteria of plaque index

- **0** = No plaque.
- **1** = A film of plaque adhering to the free gingival margin and adjacent area of the tooth.
- **2** = Moderate accumulation of plaque within the gingival pocket or on the tooth & gingival margin.
- **3** = Abundance of plaque within the gingival pocket &/ or on the tooth & gingival margin.

Measurements of periodontal diseases includes:

- ◆ **I**-Measuring gingivitis.
- ◆ **II**-Measuring periodontitis.
- ◆ **III**-Measuring plaque & calculus.
- ◆ **IV**-Measuring periodontal treatment needs.

Periodontal disease **severity** (intensity) is assessed by using *indices*.

Periodontal indices can be grouped into:

- 1) Indices that measure the degree of inflammation of the gingival tissues.**
- 2) Indices that quantify the degree of periodontal destruction.**
- 3) Indices that evaluate amount of plaque & calculus accumulation (oral cleanliness).**
- 4) Indices that assess periodontal treatment needs.**

Periodontal indices can also be divided into:

3 Types

reversible

irreversible

composite

- Some indices measure the **reversible** stage of the disease ,i.e. gingivitis
- Some other measure the **irreversible** stage, i.e. bone loss.
- The most commonly used indices measure both reversible & irreversible stages, i.e. **composite**

II- Measuring gingivitis

The gingiva should be visually examined for:



1- color :-

Healthy gingiva is normally a light **pink** in color.

Increased **redness** is a clinical sign of **gingival inflammation**.

2-architecture& size:



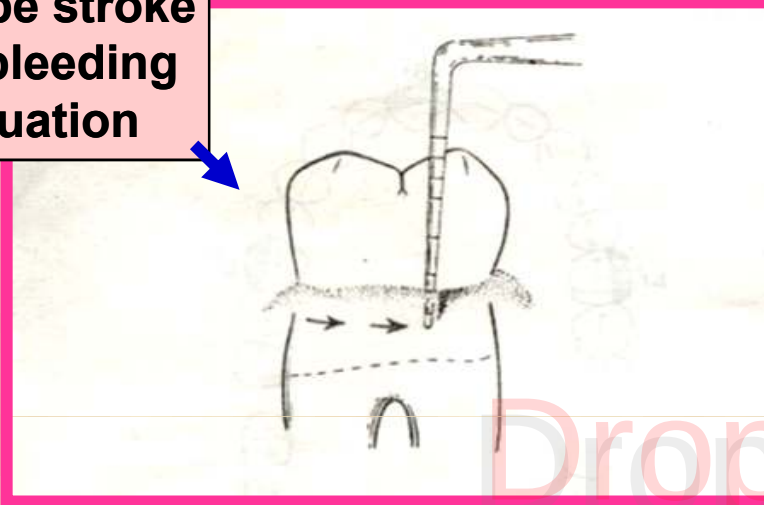
Healthy gingiva showing lack of edema & swelling with **knife-edged** free gingival margin.



Any **swelling** or **enlargement** of the marginal gingiva is a sign of inflammation ,i.e. **gingivitis**.

3-Bleeding:

Probe stroke
for bleeding
evaluation



When the inner aspect of the gingival sulcus is gently swept with the side of a periodontal probe,

Bleeding from gingival crevice is another sign of gingival inflammation.

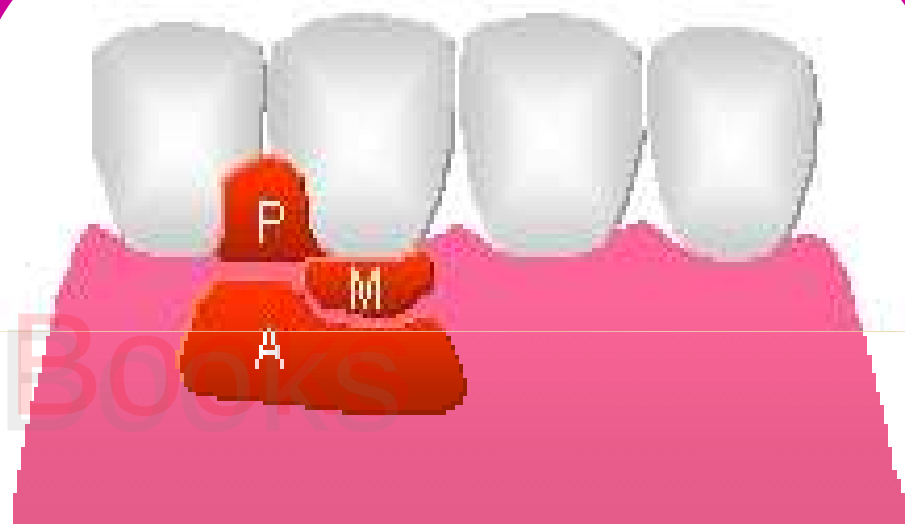
Indices that measure gingival inflammation

- 1-Papillary marginal attached gingival index.
- 2-Gingival index.
- 3-Gingival bleeding index.

P.M.A.INDEX

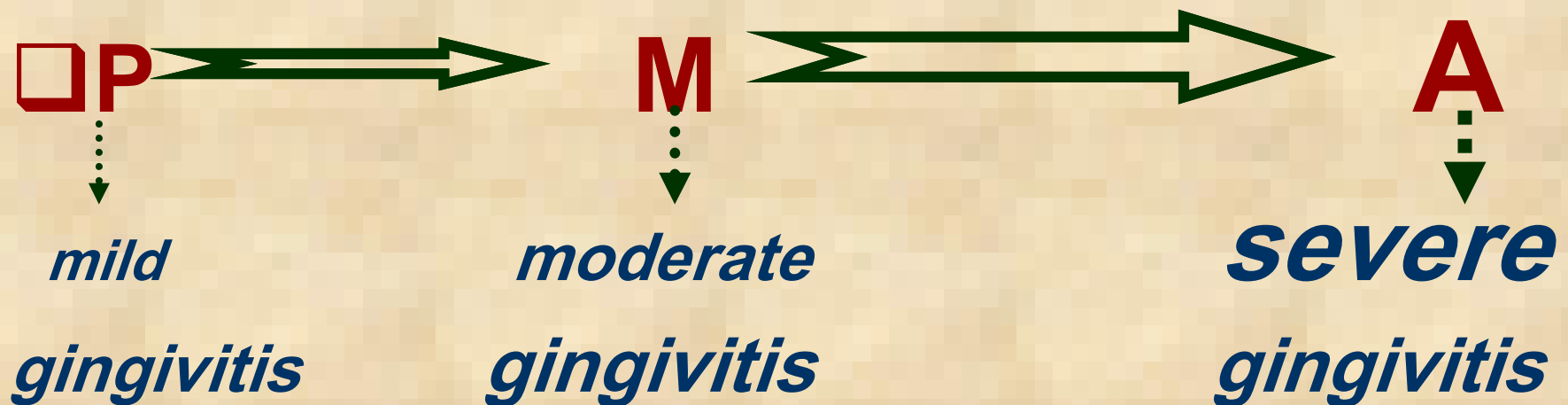
Papillary Marginal Attached Gingival index

- *It is developed by Schour & Massler in 1950.*
- *It is used to assess gingivitis among children.*
- *This index is a reversible index.*



P=Papillary , **M=M**arginal ,
A=Attached gingivae.

□ This index is based on the concept that the *number* of gingival units affected with gingivitis is an indication of *the severity* of the condition.



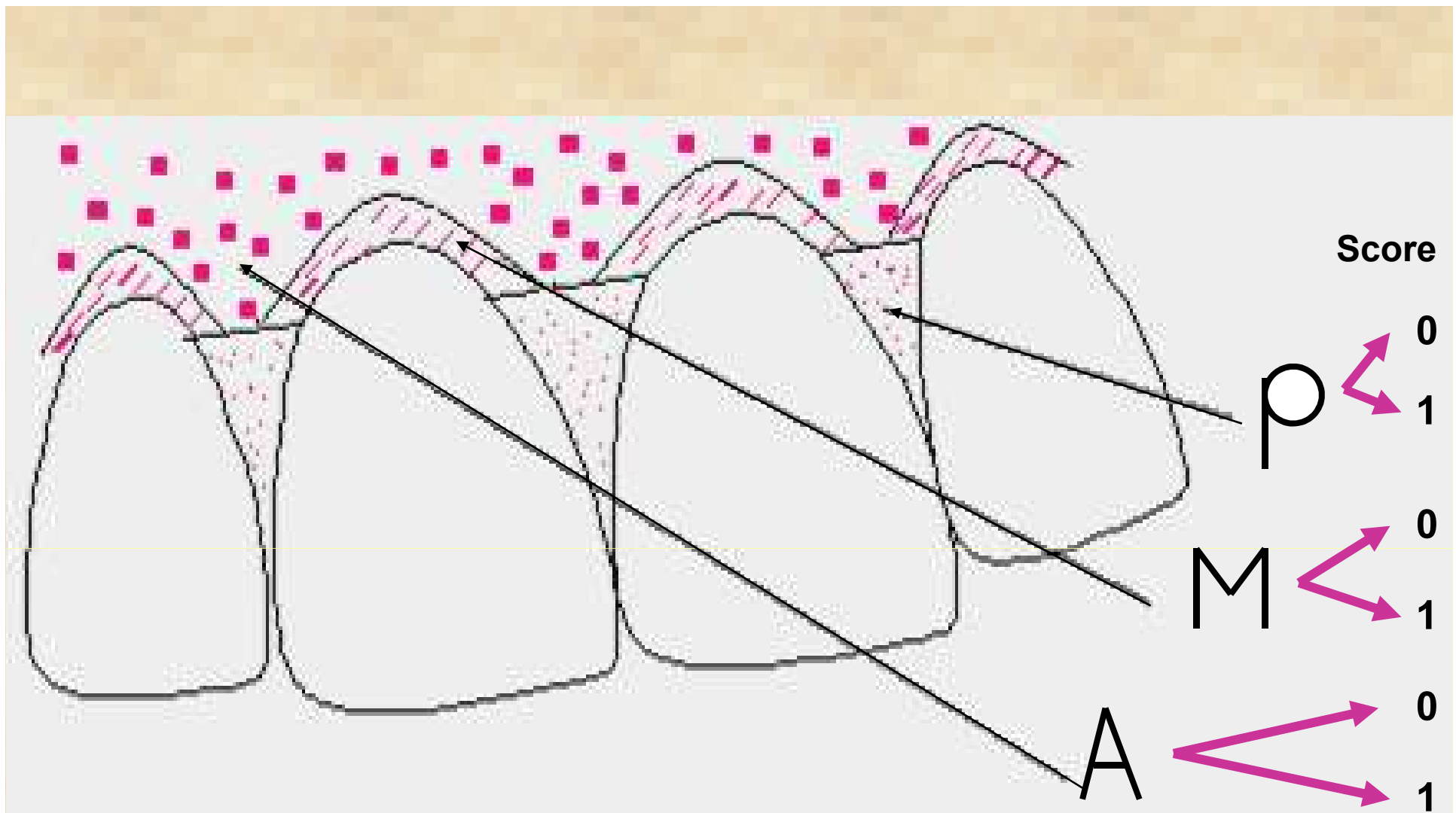
Examination & Scoring

□ Gingival tissues surrounding *all erupted* teeth are examined.

□ Examination of gingival tissues is performed *facially* (from labial & buccal aspects only).

□ *Three* gingival areas are examined for each tooth :

P	→	interdental Papilla	(mesially)
M	→	free gingival Margin	(facially)
A	→	Attached gingiva	(facially)



Three gingival areas : (P) inter- dental papilla (M) gingival margin , (A) attached gingiva . Each tooth is given a score ranged from 0 to 3.

☐ Each gingival area **P,M&A** is scored as follows:

If gingivitis is present		1
If gingivitis is absent		0

☐ Scores from all examined areas are added to obtain the **P-M-A Index** for an individual.

☐ **Criteria for diagnosing gingivitis:**

- | | |
|--------------------|----------------------|
| 1-Redness. | 2-Swelling. |
| 3-Bleeding. | 4-Ulceration. |

GINGIVAL INDEX (GI)

- GI of Loe & Silness (1963) is the most frequently used index for measuring gingivitis.
- It is used with the plaque index of Silness & Loe.
- It is a reversible index.
- It can be used to assess severity of gingivitis in epidemiologic surveys as well as in clinical trials.

Criteria for the gingival index

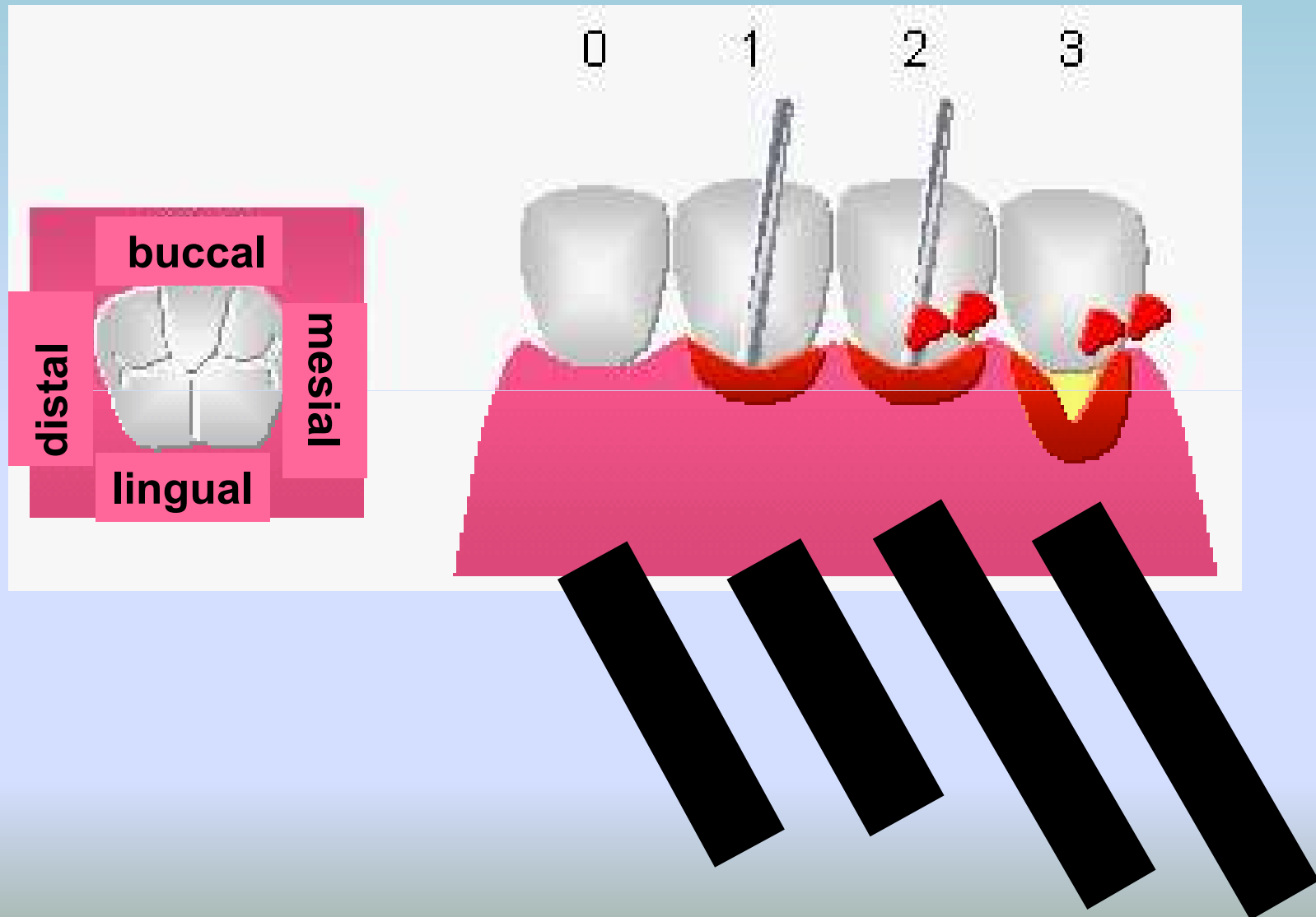
0: Normal gingiva.

1: Mild inflammation=slight change in color, slight edema, no bleeding on probing.

2: Moderate inflammation=redness, edema, glazing, bleeding on probing.

3: Severe inflammation=marked redness & edema, ulceration, tendency to spontaneous bleeding.

Criteria for the gingival index





Spontaneous bleeding indicating score 3
according to GI of Loe & Silness.

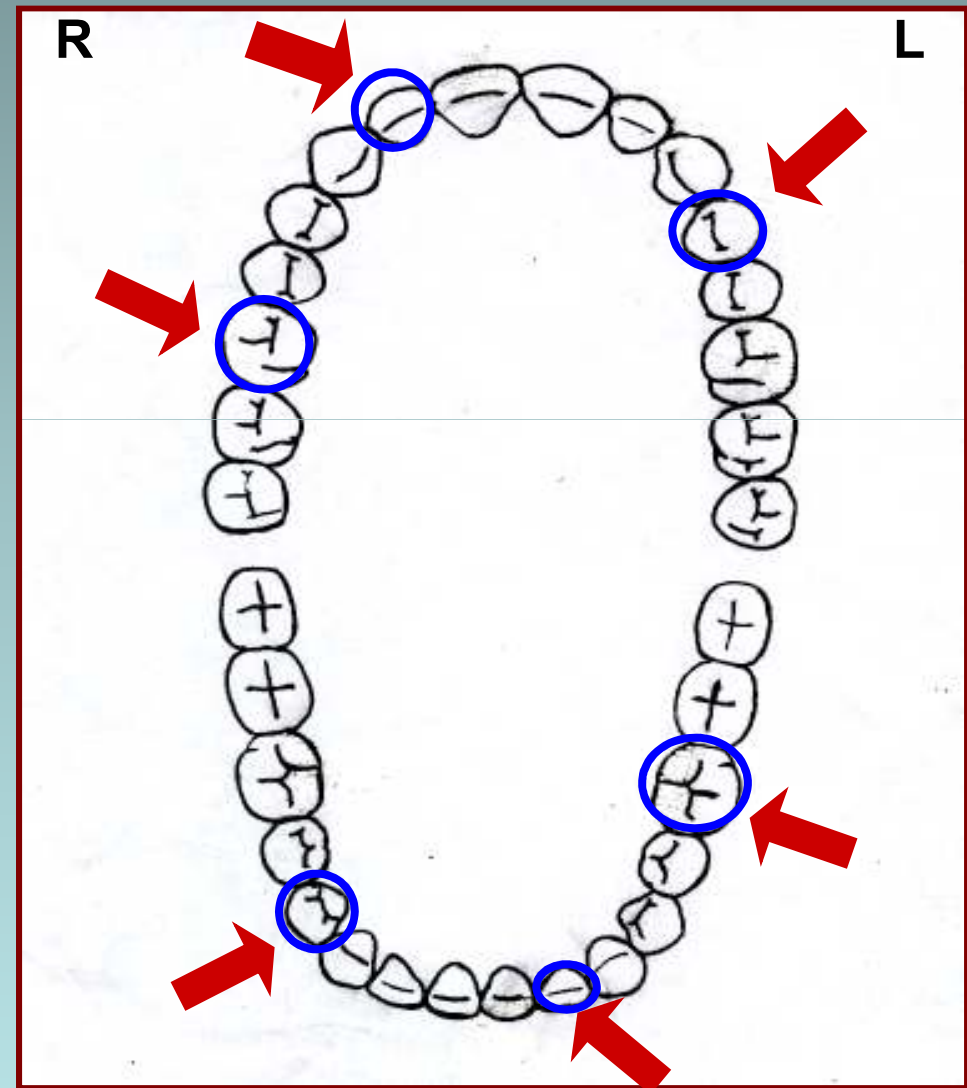
Selection of teeth for scoring GI :

✗ The entire dentition.

OR

✗ Selected teeth:

R	6	2	4	L
	4	2	6	



SCORING OF GI:-

- *Each selected tooth is examined on 4 areas: [Mesial, Distal, Lab, & Ling.]*
- *Each of these 4 gingival areas is scored on scale from 1 to 3 according to the criteria.*
- *The scores around each tooth are totaled & then divided by 4 → mean GI for the tooth*

● The means of GI for teeth are then **divided by** the No. of teeth examined
→ **mean GI for the individual.**

● The means of GI for all individuals in the group are then **divided by** their No. to give → **mean GI for the group.**